STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Illinois Bell Telephone Company	)	
	)	Docket No. 00-0393
Proposed Implementation of High	)	
Frequency Portion of Loop (HFPL)/Line	)	
Sharing Service	)	

DIRECT TESTIMONY ON REHEARING OF JAMES D. DUNBAR, JR. ON BEHALF OF SPRINT COMMUNICATIONS L.P.

*****Public Version*****

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INTRODUCTION

Q. Please state your name, place of employment, and business address.

A. My name is James D. Dunbar, Jr. I am employed by Sprint/United Management Company as a Senior Manager – Network Costing at 6360 Sprint Parkway, Overland Park, Kansas 66251. I am testifying on behalf of Sprint Communications L.P. (hereafter referred to as "Sprint" or the "Company").

Q. What is your educational background?

A. I received a Bachelor of Science in Engineering degree from Pennsylvania Military College (now Widener University), Chester, Pennsylvania with a split emphasis in Computer Design Engineering and Nuclear Reactor Engineering. In 1983, I received a Master of Business Administration degree from James Madison University, Harrisonburg, Virginia with an emphasis in Business. I have also completed numerous industry engineering, planning, and costing related courses covering general, outside plant, traffic, and transmission engineering, transmission noise mitigation, technical planning, equipment deployment, and costing. I have attended numerous manufacturer seminars on the latest NGDLC equipment and its deployment.

Q. What is your work experience?

A. From 1966 to 1970, I served as an Officer in the U.S. Army Signal Corps leading or commanding signal units on various communications assignments including command of a U.S. Strike Force International Communications Team. Responsibilities included the provision of FM, UHF, microwave radio, radio/wire integrated links, landline, switching, operator services, network control, and secure communications. Following active duty, I continued in a reserve status assigned primarily to the U.S. Army Air Defense School at Ft. Bliss, Texas as a senior communications instructor and course analyst.

From 1970 to 1973, I was employed by the Denver & Ephrata Telephone & Telegraph Company in Ephrata, Pennsylvania. My various assignments during that period included outside plant engineering, traffic engineering, COE engineering, PBX engineering, development of certain cost studies, and some Circuit Equipment maintenance.

Sprint Corporation or one of its predecessor companies has employed me since 1973. From 1973 to 1985, I was located in Virginia. From 1973 to 1974, I was an Outside Plant Engineer with responsibility for many projects including a complete rework of the University of Virginia loop plant. I worked as a Transmission Engineer during 1974 and then was assigned to manage the state capital budget and outside plant planning group for the 1974 to 1976 period. This group was assigned responsibility for engineering all outside plant capital projects in excess of $25,000 and

budgeting for all classes of plant. From 1976 to 1978, I was District Plant Manager for the 1800 square mile Southern Virginia District where I managed the Construction, Maintenance, and Installation forces.

From 1978 to 1984, I managed various Regulatory costing functions, including the state depreciation and cost separations group. From 1984 to 1985, I was General Manager - Interexchange Services where I managed the cost separations, rates and tariffs, depreciation, and the interexchange carrier billing/contract and interface functions. I also was a member of the Virginia Telephone Association Separations Committee.

From 1985 to 1993, I was General Staff Manager - Separations for the predecessor Centel Corporation staff in Chicago, Illinois. My job functions included managing the cost separations staff, the revenues and earnings monitoring function, the programming and modeling support for those functions, and cost issue analysis activities such as rate of return versus price caps and FCC/NARUC rule changes. I was the primary corporate interface with USTA and NARUC for technical issues. I served on the USTA Technical Operations Committee, the Price Caps Team (from 1987 to 1991), and the Policy Analysis Committee. I also taught a portion of the USTA Separations Classes.

From 1993 to the present, I have been assigned to the Sprint/United Management Company Regulatory Staff. The departmental focus was changed last year from support of the Local Telephone Division to support of all corporate entities.

From 1993 to 1994, I was Manager - Separations with responsibility for the merger of the Centel and Sprint separations functions and various other costing and monitoring activities. Since 1994, I have been in my current position with various responsibilities including analysis and modeling of costing issues, such as LIDB and 800, broadband implementation, local loop, and the development of the Benchmark Costing Models sponsored by Sprint Corporation and others. I have co-authored each of the Benchmark Cost Models including Benchmark Cost Model (BCM) versions 1 and 2, Benchmark Cost Proxy Model (BCPM) versions 2, 2.5, 3.0 and 3.1 and a Sprint Loop Cost Model (SLCM). I currently manage a group responsible for all loop costing and modeling. I was also a charter member of the Telecommunications Industries Analysis Project (TIAP) (currently sponsored by the University of Florida) industry team. As a member of that team, I helped to develop the TIAP Broadband Model and participated in the writing of numerous TIAP papers on current telecommunications issues.

Q. Have you testified previously before state regulatory commissions or appeared before the FCC Commissioners and Staff?

A. Yes, I have testified before this Commission and the Commissions in Florida, Kansas, Missouri, Nevada, New Jersey, North Carolina, Oregon, Pennsylvania, Texas, Virginia, and Washington and have presented numerous cost modeling NARUC and Commission workshops on and off

the record in states all across the nation. In the Federal arena, I have presented many workshops and exparte presentations to the FCC Commissioners and their staffs. I participated in weekly workshops with the FCC Common Carrier Bureau Staff during the development and selection of an interstate USF cost model.

Q. Did you provide testimony in this case earlier?

A. Yes. I presented Sprint's positions in this docket related to loop conditioning charges. It is my understanding that the Commission did not grant rehearing on that issue.

PURPOSE

Q. What is the purpose of your testimony here?

A. My testimony will demonstrate to the Commission that access to the network created by the Project Pronto upgrades is technically feasible and will not create the exaggerated costs Ameritech has proposed. My testimony demonstrates that Ameritech's claims of additional NGDLC equipment costs and inefficiencies for collocation of line cards in the Project Pronto equipment are highly exaggerated and when properly examined either do not exist or are within reason for a multiple provider local network environment.

To understand the correct nature of any Project Pronto expenditures, it must be recognized that these expenditures are a continuation of a normal upgrade of the Ameritech local network that has been in progress for a number of years. The efficiencies and capabilities incorporated are an inherent part of normal technology upgrades that must be available for use by competitive LECs. Costs related to collocation, network efficiency improvements, and expanded services, *if any and particularly if market driven*, are also part of the normal network upgrade/expansion costs. CLECs should not be denied access to Ameritech's loop network simply because normal network expansion may be necessary to accommodate customer demand. The development of appropriate TELRIC rates for use of capacity in Ameritech's network is the answer; not denial of access to the incumbent's loop network.

Q. How is your testimony organized.

A. First, I will demonstrate how the Project Pronto investments undertaken by Ameritech are more properly characterized as a network evolution or upgrade rather than an overlay as portrayed by Ameritech.

Next, I will address the two key unbundled network element (UNEs) identified in the Commission's Order that Ameritech witness Keown claims would have "a significant impact on the capacity and utilization of Project

Pronto NGDLCs and would add significant capital costs to deployment of Project Pronto equipment".[1]

Finally, I will address several of Commissioner's Squires questions.

PROJECT PRONTO IS A NETWORK UPGRADE

Q. Mr. Keown presents a description of Project Pronto that becomes his basis for the justification of large additional costs related to the collocation of line cards. He characterizes Project Pronto as an "overlay network" on page 4 of his testimony. Is Project Pronto correctly characterized as a separate broadband overlay?

A. No. It is not. First of all it is an upgrade of their network to fully implement the Carrier Serving Area (CSA) design. An integral part of any CSA design is the presence of a remote terminal within the CSA that allows the copper portion of the loop to be limited to 12 kilofeet (kft).

Q. Is this unique to the Project Pronto network?

A. No. CSA design was introduced in the mid 1980's to take advantage of reduced electronics costs that provided an economic alternative to a copper loop. It also was the first loop design criteria specifically designed to provide a higher bandwidth for enhanced services to every customer.

[1] Keown Direct on Rehearing, p. 11.

In the early 1970's, analog carrier became an alternative to copper reinforcement. Vendors produced single and multi-channel carrier that could "ride" existing copper loops to add subscriber pairs. Six and eight channel systems were popular. T1 carrier was present but too costly to replace copper.

As costs of these systems began to decline, it became economical to use these carriers to serve small areas including some loop backfeeding. The concept of planning service areas started to take place. As these plans developed, costs of carrier including the T1 systems were dropping to the point that larger serving areas now using T1 for subscriber loops was economical. By 1987, Bellcore had produced Technical Reference TR-TSY-000057. It was revised in 1988. This reference presented CSA design guidelines that were recommended for use by Network Planners to increase the capacity of every subscriber loop to 56kilobits (kbps) per second. This would allow for the implementation of 56kbps based services and basic ISDN. In section 3.1.3. of T1E1.4/98-002, is found "The concept of Carrier Serving Area (CSA) engineering guidelines was originally developed in the early 1980's to support 56 kb/s Digital Data Service (DDS) delivery to customers served by DLC systems. The concept was then revised very slightly and has been used as the guide for voice grade special services and POTS deployment from the DLC remote terminal."

CSA design included the use of a remote terminal (RT) within the CSA that was connected by carrier to a Central Office Carrier Terminal (COT). This would make all loops appear to the CO switch as if they were within the 12kft limit and giving every customer access to higher speed data. Later in 1988, Bellcore issued document T1E1.4/88-144 that presented several issues needing resolution prior to implementation "of a high rate DSL transmission" - one of which was the new CSA concept into any improved speed services. By the early 1990's, CSA design was an integral part of exchange planning[2].

In the T1E1.4 workgroup minutes of their July 25-28, 1988 meetings you find participation of Alcatel and Ameritech in support of a "high rate DSL project" which Ameritech stated should not be limited "to any bit rate or hierarchy".

In 1992 and 1993, technical discussions were well underway for the implementation of ADSL standards. In a March meeting of the T1E1.4 workgroup, Tom Starr of Ameritech presented a document to the workgroup[3] that included the following statements:

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2 See, for example, the AT&T Outside Plant Engineering Handbook dated 1994.
3 T1E1.4/93-015.

1. "The objective loop range of the ADSL should be all Carrier Serving Area (CSA) loops."
2. "The ADSL is planned to provide local access for Video Dial Tone (VDT) and work-at-home services."
3. "By 1995 Ameritech fiber deployments are expected to result in approximately 90% of copper loops being within CSA loop reach of a Central Office, active carrier system, or a fiber site where a carrier system could be quickly deployed."

Activities identical to a large portion of Project Pronto were obviously underway in the early 1990's. Based on Ameritech's main investor briefing document on Project Pronto[4], project funds include $4.5 billion that "will be directed toward improvements to the basic local loop infrastructure (i.e., fiber feeder and next-generation remote terminals)." This is precisely the same activities that were occurring throughout the 1990's. The briefing also stated[5] that the $4.5 billion will "initially extend the reach of broadband capability to more than 80 percent of its customer base. SBC estimates that this deployment will immediately enable at least 60 percent of its broadband customers to have guaranteed download speeds of six megabits per second (Mbps)."[6] The full CSA design for this

[4] "SBC Announces Sweeping Broadband Initiative", Investor Briefing No. 211, October 18th, 1999, (Investor Briefing), p 2. http://www.sbc.com/Investor/Financial/Earning_Info/docs/IB211.pdf., See JRB-2.
[5] Investor Briefing, Page 4.
[6] Investor Briefing, Pages 5-6.

60 percent of the 80 percent is absolutely inherent in this statement. That speed cannot be "guaranteed" unless the loop is CSA designed or better.

From the other $1.8 billion portion of Project Pronto expenditures, we see 25 percent being targeted to "upgrading a significant number of copper-based DS1s to new, lower cost fiber facilities. Another 25 percent will be targeted for moving existing voice lines to new fiber-fed remotes. The remaining 10 percent will be targeted for upgrading the overall condition of the network."[7] This equates to expenditures of $450 million for DS-1 conversion, $450 million for movement of existing customers to the new fiber-based remotes, and $180 million for network upgrading. This is a total of $1.08 Billion for additional network upgrades for existing customers to use the new fiber and electronics. Project Pronto does upgrade the outside plant facilities for current voice and data customers in addition to any ADSL implementation. Again, this outside plant upgrade is the same type of work performed in the early 1990's and forward. Competition has merely sped up the upgrading of the network capability.

Q. How do the Project Pronto DLC changes compare to prior network upgrades.

A. DLCs have always been a part of the CSA design. Digital carrier, that was initially T1, carried signals between the RT and the COT. Appropriate

service specific line cards were placed at both ends of the circuit. A copper jumper or tie cable carried the electrical signal for each service to its CO destination. Each service had its designated time slot(s) in the carrier signal. DLC implementation provided a significant economic advantage versus copper when doing planning for longer loops including 56kb, ISDN BRI, and DSL loops.

Switch electronics evolved to allow the COT or even the RT to directly connect voice grade services to the switch at a DS1 level using DS1 interfaces in the switch and COT instead of the cost of a switch line card and COT line card per loop. Non-switched services still required individual cards in the COT.

Q. What are the next generation DLCs (NGDLCs) and how do they impact the network?

A. The NGDLC have moved away from the older T1 signaling that assigned a fixed number of bits and position in the 1.544mb bit stream. Because this tied up bandwidth even when the circuits were idle, a statistical sampling process was developed where idle channels no longer used bit positions but released their time slots for use by the active channels. A large portion of our current user data transmissions is sporadic or clustered. This lends itself to the newer packetized signaling of ATM and

[7] Investor Briefing, Pages 6-7.

SONET on fiber. NGDLCs take advantage of this increased data throughput to increase the overall efficiency of the RT to COT data transport capacity. The voice transmission path remains a Time Division Multiplexed (TDM) signal. The TDM architecture in the voice OC-3 is the very same as that of the original T1 – merely faster.

The Alcatel Litespan Planning Guide, JDD-1[8] very clearly delineates the TDM versus ATM usage. Section 2 on page 1 reads ***

*** (Emphasis added.)

The entire industry is moving forward every year to take advantage of these new economies and capacities. Forty percent of the $1.8 billion in Project Pronto ($720 million) is targeted to provide "Voice Trunking Over ATM or VTOA."[9] Since data traffic, for example, for Internet access is usually trunked to another facility via a high speed circuit to an ISP, it also became more efficient to allow packet traffic to connect directly to a traffic

[8] Confidential, Alcatel Litespan Integrated ADSL/G.SHDSL *Planning Guide, April 2001* (Planning Guide).

router with ATM trunks. This would eliminate the requirement for individual circuit COT line cards and allow them to be replaced with OC3 direct connections.

These changes are but another upgrade in the Ameritech network that parallels industry and equipment development trends. It is being applied to the voice network as a service upgrade to improve efficiencies and reduce cost while more rapidly making available enhanced service capability. Many of these network enhancements were being incorporated prior to the advent of Project Pronto. Data received by the Competitive Local Exchange Carriers (CLECS) in response to their Data Request Number 1 to Ameritech[10] shows that there are Project Pronto dollars being expended on *** *** RTs during 2000 and 2001. Of this number, *** *** or *** *** are retrofit or upgrades to existing sites. Of the dollars expended on RTs however, only *** *** is assigned to the retrofits and upgrades. Obviously, many of the RT locations were at or close to broadband ready prior to Project Pronto. Again we see that Project Pronto has only compressed the timing on a pattern of network upgrades to higher band services that was started years before.

9 Investor Briefing, page 4.
10 DR Response 1-1.

Q. Are the Litespan 2000 and 2012 NGDLCs used to provide voice services in addition to xDSL service?

A. Mr. Keown states on page 6 of his testimony that Ameritech primarily intended to use the Alcatel Litespan 2000 and 2012 systems. Both of the Litespan 2000 and 2012 systems support up to 2,016 voice grade lines in addition to ADSL capabilities. In fact, before Project Pronto and before the Litespan 2012 OC-12 optics and ADSL channel cards became commercially available, the Litespan 2000 Alcatel NGDLC was being used throughout the industry for fiber served NGDLC upgrades of the 2 wire voice loop plant. It was an integral part of many LECs CSA implementation. Use of the Litespan 2000 was sufficiently prevalent among all of the larger LECs that it became one of two systems used in the Large NGDLC design and cost inputs in the forward-looking BCM and BCPM voice grade USF national cost modeling. The Litespan 2000 voice over fiber capabilities and costs were still an integral part of the latest BCPM version 3.1 that was adopted by a number of states for forward-looking loop cost modeling.

The Litespan voice circuits ride a Time Division Multiplexed (TDM) OC-3 while the ADSL rides one or more OC-3s. Alcatel confirms this in its practices, presentations, and its October 12, 2000 comments filed with the FCC that have been made a part of this proceeding. Witness Ireland

confirms Pronto expenditures for voice service enhancements.[11] Ameritech's response to DR 1-1 shows a table of central office locations with *** *** of the RTs equipped with integrated voice capability. Tab 8.5 of the broadband cost study included as Schedule CM-1 shows the Litespan 2000 system equipped for *** *** voice grade lines and *** *** ADSL lines. The study uses a *** *** allocator of common equipment to ADSL services – the balance being voice service. Thus, even the "new" NGDLC RT system dollars being spent under Project Pronto are attributed *** *** to POTS voice service. The percent of COT NGDLC dollars attributed to voice grade will be even higher since the COT hands off ADSL traffic at the OC-3 level while voice POTS traffic must be multiplexed down to a DS-1 card level for switch integration.

Q. What are the implications of the foregoing discussion if, as you have demonstrated, Project Pronto is more properly considered a general network upgrade rather than an overlay?

A. My testimony has placed the Project Pronto network upgrade into proper perspective from an engineering and cost standpoint. The Project Pronto network is merely a continuation of technology implemented in the 1980's to efficiently engineer local telephone networks. Many of the dollars being spent by SBC/Ameritech on Project Pronto are for voice service enhancements. Project Pronto is not an overlay network; it is an

[11] Ireland Direct on Rehearing, P. 6, f.n. 1.

integration of network elements used to efficiently carry data into the existing CSA design concepts introduced in the 1980's. The addition of ATM trunking between the CO and the NGDLC RT is also just another efficiency improvement over TDM to handle the burstiness of the data traffic. Sprint witnesses Jim Burt and Brian Staihr will address Ameritech's claims that it should not unbundle its loop network.

AMERITECHS CLAIMED COSTS ARE OVERSTATED

Q. From a network engineering perspective, Ameritech witness Keown identifies two of the UNEs ordered by the Commission as having an "adverse impact". Please identify those UNEs.

A. On page 11 of his testimony, witness Keown identifies the UNEs as:

i. The lit fiber consisting of PVCs and PVPs.

ii. The ADLU cards owned by the CLEC and "collocated" in Ameritech Illinois's NGDLC equipment at the RT;

iii. Combinations of the above.

These two UNEs are the primary drivers of the $519 million in costs claimed by Ameritech. I will address each of these UNEs below and demonstrate that Ameritech's claimed costs are highly exaggerated.

Q. Please comment on Mr. Keown's statement beginning on page 8, line 12 of his Direct Testimony that states "Each of the three Channel

Banks in an NGDLC that can provide ADSL service is assigned to a single PVP."

A. While the single PVP per channel bank (CBA), or VPC as Alcatel refers to it, may have been correct for versions 10.x of the NGDLC software, release version 11 that is pending allows for multiple PVPs per CBA.[12]***

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[12] See Alcatel Supplemental Response to Eighth Set of Discovery Requests. ("Alcatel Response") Alcatel claims that Software Release 11 will be available for customer laboratory testing on or about *** ***

[13] Litespan-DSL, ATM/DSL Feature Roadmap, JDD-5, page 27 (Roadmap). See Alcatel Response, pp. 4-5.